Inspire Device Explantation in a Nationwide Database: Patient Demographics and Temporal Metrics

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INTRODUCTION

- Hypoglossal nerve stimulation (HNS; Inspire) is an alternative therapy in CPAP intolerant patient
- Patients who undergo device explantation represent a unique population
  - Adverse events
  - Infection
  - Hardware failures
  - Cosmesis
  - MRI incompatibility
  - Suboptimal use
  - Twiddler's syndrome
- Rarely, revision without explantation is required
- Limited information is available on rates and timing of explantation and revision
  - Up to 50% of adverse events may require return to the operating room

METHODS

- PearlDiver Mariner Patient Claims Database
  - 170 million patients across all payers 2010 – 2023
- CPT code queries
  - 64582 - implantation
  - 64583 - revision
  - 64584 – explantation
- Inspire-specific codes implemented 1/1/2022
- Pediatric patients excluded
- Patient demographics and time to explantation, revision analyzed

RESULTS

Table 1. Demographics and time to second surgery

	Implantation Only (n=5356)	Explantation (n=19)	Revision (n=22)
Age (years) (median, [IQR, range])	65 (56-72, 19-85)	58 (51.5-69.5, 44-80)	63.5 (58.25-72.5, 27-80)
Sex (%)			
Male	65.3	68.4	54.5
Female	34.6	32.6	45.5
Year of Implantation (%)			
2022	73.4	57.9	100
2023	26.6	42.2	0
Time to Second Surgery (days) (median [IQR, range])	N/A	105 (63-167, 30-295)	135 (68-224, 2-438)

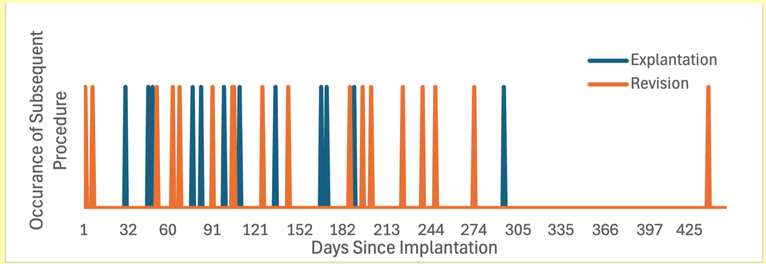

Figure 1. Timeline of Inspire explantations and revisions

DISCUSSION

- Understanding HNS device malfunctions and adverse events is critical to understanding patient non-adherence
- In this study, there was a 0.35% explantation rate, and a 0.41% revision rate
- Timing
  - Explantations: between 30 - 295 days post-procedure
  - Revisions: wider range between 2 – 438 days post-procedure
- Limitations include lack of Inspire-specific codes prior to 2022

CONCLUSION

- Device explantation is a rare but consequential outcome of Inspire surgery
  - Explantation rate remains exceedingly low
  - Highest risk occurred within the first year of surgery
- Device revision, is also rarely required
- Further investigation is required in order to determine those at highest risk for adverse events, hardware issues, and suboptimal use

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